EM *U.S. Department of Energy*
Office of Environmental Management

Action Memorandum
for the
Separations Process Research Unit (SPRU)
Disposition Project

September 2007

Prepared for
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SPRU Project Office

Prepared by
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ACRONYMS

AEC	Atomic Energy Commission
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DOE	U.S. Department of Energy
EE/CA	engineering evaluation/cost analysis
EM	Office of Environmental Management
EPA	U.S. Environmental Protection Agency
HSA	historical site assessment
KAPL	Knolls Atomic Power Laboratory
LL	Lower Level
NPL	National Priorities List
NR	Office of Naval Reactors
NYSDEC	New York State Department of Environmental Conservation
SPRU	Separations Process Research Unit
UL	Upper Level

1. PURPOSE

The purpose of this action memorandum is to document selection of the actions for disposition of facilities, soil, and groundwater contamination for the Separations Process Research Unit (SPRU) Disposition Project nuclear facilities and land areas within the Knolls Atomic Power Laboratory (KAPL) site located in Niskayuna, New York. The U.S. Department of Energy (DOE), using its authority under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), is pursuing removal of the SPRU nuclear facilities and contaminated soil in the associated land areas using the non-time critical removal action process.

2. SITE DESCRIPTION AND BACKGROUND

SPRU occupies approximately 30 acres of the 170-acre KAPL site in eastern New York State. The Atomic Energy Commission (AEC) established KAPL in the mid-1940s to research the process to separate uranium and plutonium from irradiated materials and to conduct nuclear reactor research. AEC built the SPRU pilot-scale facility to research the chemical process. Figure 2-1 provides the layout of the KAPL site with the locations of the SPRU nuclear facilities and associated land areas.

Figure 2-1. SPRU Nuclear Facilities and Land Areas

The DOE Office of Environmental Management (EM) oversees the SPRU Disposition Project. The SPRU Disposition Project includes:

- Building G2;
- Building H2, including the H2 Tank Farm;
- Contaminated soil adjacent to or originating from Buildings G2 and H2 (Upper Level land area);
- Contaminated soil in the vicinity of the Former K5 Retention Basin, Former K6 and K7 Storage Pads, and the Railroad Staging Area (Lower Level land area);
- Contaminated soil associated with SPRU waste storage in the North Field area; and
- Contaminated soil associated with SPRU used in the Lower Level Parking Lot as fill (Lower Level land area).

Attachment I provides figures and photos of the SPRU nuclear facilities and land areas. SPRU operated between February 1950 and October 1953. Decommissioning of the SPRU facilities began in October 1953 and continued through the 1990s. The SPRU nuclear facilities and associated land areas contain residual radioactive and chemical contaminants and are currently under surveillance and maintenance. In 1988, the Environmental Protection Agency (EPA) conducted a preliminary assessment at KAPL, including the SPRU facilities, and concluded that the site did not pose an imminent danger to human health or the environment and, therefore, SPRU was not included on the CERCLA National Priorities List (NPL).

The *Nuclear Facility Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project* (Facility HSA, R-002266) and the *Land Areas Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project* (Land HSA, R-002255) present the history and current conditions, including the nature and extent of contamination and detailed property identification and description, of the SPRU nuclear facilities and land areas, respectively.

KAPL safely manages the SPRU facilities; however, they are largely unused by DOE or the Office of Naval Reactors (NR). The existence of residual contamination and the specialized purpose for which AEC designed these facilities make them largely non-usable. EM will transfer the areas occupied by the SPRU facilities to NR upon completion of decontamination and decommissioning. Implementation of the removal actions described in this action memorandum will restore the areas occupied by the SPRU facilities.

The objectives for the selected actions are:

- Ensure that site workers will not be exposed to more than an additional 25 milliRem from residual radioactive contamination left in the soil;
- Meet New York State Department of Environmental Conservation (NYSDEC) “No Further Action” requirements for residual chemical contamination in soil and groundwater; and
- Remove sources of local groundwater contamination.

In their current state, the SPRU nuclear facilities and land areas do not pose a threat to public health or welfare or the offsite environment. However, action is needed to prevent risk to future site workers.

3. SELECTED ACTIONS AND ESTIMATED COSTS

The *Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project* (Facility EE/CA, R-002272) and *Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project* (Land EE/CA, R-

002271) documents identify, describe, and evaluate alternatives considered for the disposition of the formerly utilized SPRU facilities and associated land areas, respectively.

3.1 Selected Actions

3.1.1 SPRU NUCLEAR FACILITIES

The Facilities EE/CA (R-002272) evaluated four alternatives to address the SPRU nuclear facilities. DOE has selected Alternative 4, Removal of SPRU Facilities, as the action for disposition of the SPRU nuclear facilities. This action was selected because it best satisfies the evaluation criteria presented in the EE/CA (i.e., effectiveness, implementability, and cost). The selected alternative was also the alternative most preferred by the public and regulatory authorities, as expressed during the May 15 to June 5, 2006 public comment period (*Response to Public Comments, Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, R-002274). This effort will start in 2008 and finish in 2014.

Under this removal action, DOE will remove the buildings and residual radioactive contamination. This removal action will involve decontamination and removal of piping, tanks, and equipment from the SPRU facilities; removal of Building H2, the H2 Tank Farm, the G2-H2 Pipe Tunnels, and Building G2; decontamination of the E1 and G1 Pipe Tunnels; and excavation and removal of contaminated soil around the perimeter of the facilities.

Incidental contaminated soil above the tank vaults and soil in the footer drain around the perimeter of Buildings G2 and H2 will be removed. After verifying that the objectives for the selected actions have been achieved, the excavations will be backfilled with clean backfill material and compacted. Backfill material could include imported soil, excavated on-site soil, and crushed concrete.

Wastes generated during this removal action will be characterized and segregated by waste type (e.g., transuranic, low-level radioactive, mixed low-level radioactive, hazardous, and non-hazardous). DOE will transport and dispose of the remaining contaminated soil, concrete, and demolition debris at an approved offsite disposal facility.

3.1.2 SPRU LAND AREAS

The Land EE/CA (R-002271) evaluated two alternatives to address the SPRU Upper Level (UL) land area and three alternatives to address the SPRU Lower Level (LL) land area. DOE selected Alternative UL-2, Upper Level Soil Removal, as the action for disposition of the SPRU Upper Level land area. DOE selected Alternative LL-2, Lower Level Soil Removal, as the action for disposition of the SPRU Lower Level land area. These actions were selected because they best satisfy the evaluation criteria presented in the EE/CA (i.e., effectiveness, implementability, and cost). The selected alternatives were also the alternatives most preferred by the public and regulatory authorities, as expressed during the December 22, 2006 to January 26, 2007 public comment period (*Response to Public Comments, Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, R-002273). These efforts will start in 2008; the Lower Level removal action will finish in 2010, and the Upper Level removal action will finish in 2014.

The action for the Upper Level will be removal of contaminated soil that underlies the facilities so as to meet the objectives for the selected actions. (Note that removal of contaminated soil above the facilities or in association with the footer drains is part of the selected action for the SPRU nuclear facilities.) At this time, DOE does not have evidence that radioactive contamination extends below the building into the underlying soils. For planning purposes, DOE has included excavation of six feet of soil from beneath Building H2 and the Tank Farm. After verifying that the objectives for the selected actions have been achieved, the area will be restored.

The action for the Lower Level Parking Lot and Railroad Staging Area will be removal of contaminated soil so as to meet the objectives for the selected actions, followed by restoration of the areas. DOE assumes that soil will be removed to an average depth of four feet in the Lower Level Parking Lot. Residual contamination below four feet in this area is not expected to pose an exposure risk to future industrial users. However, confirmation sampling will be conducted to ensure that the objectives for the selected actions have been met before restoring the area. Soil removal in the Railroad Staging Area will extend to an assumed average depth of four feet with deeper localized excavation to remove continuing sources of strontium-90 to local groundwater in that area. Confirmation sampling will be conducted to verify that objectives for the selected actions have been met prior to restoration of the areas to grade.

Wastes generated during implementation of these removal actions will be characterized and segregated by waste type (e.g., low-level radioactive, mixed low-level radioactive, hazardous, and non-hazardous). DOE will transport and dispose of contaminated soil and debris at an approved offsite disposal facility.

The Land EE/CA (R-002271) also presented an evaluation of alternatives for the North Field land area, including the Slurry Drum Storage Area. DOE has deferred selection of a removal action for the North Field land area until investigation of the non-SPRU related areas adjacent to the North Field is completed; this is expected by 2012. At that time, DOE will reevaluate the North Field alternatives for the cleanup of radioactive contamination. In their current state, the SPRU-related areas of the North Field do not pose a threat to public health or welfare or the offsite environment. DOE controls access to the North Field to prevent worker exposure and inadvertent disturbance of contaminated soil.

3.2 Estimated Cost

DOE's estimate for the selected actions for the SPRU nuclear facilities and the Upper Level and Lower Level land areas is approximately $199 million, as documented in the Facility and Land EE/CAs (R-002272, R-002271).

4. EXPECTED OUTCOMES OF THE SELECTED ACTION

When implemented, the selected actions for the SPRU Disposition Project are expected to have the following outcomes:

- Largely unused nuclear facilities, portions of which are contaminated with radioactive and hazardous materials, will be removed;
- Soils contaminated with radioactive and hazardous materials will be removed so as to meet the objectives for the selected actions;
- Radioactive and hazardous wastes (including transuranic waste) resulting from the removal of buildings and cleanup of soil will be appropriately classified, transported, and disposed of at offsite facilities;
- SPRU disposition project areas will be returned to NR for continuing mission use; and
- Surveillance and maintenance activities for the SPRU nuclear facilities and land areas (with the exception of the North Field) will be discontinued.

5. RESPONSIVENESS SUMMARY

The following documents and fact sheets have been made available to the public:

- Project Overview Fact Sheet, February 2006

- *Nuclear Facility Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project,* April 2006
- *Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project, Final*, July 2007 (draft made available May 2006)
- Facility Alternatives Fact Sheet, May 2006
- *Response to Public Comments, Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, November 2006
- Facility EE/CA Response to Comments Document Fact Sheet, December 2006
- *Land Areas Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project,* November 2003 (revised December 2006)
- Land Area Documents Fact Sheet, December 2006
- *Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project, Final*, July 2007 (draft made available December 2006)
- Land Alternatives Fact Sheet, December 2006
- *Response to Public Comments, Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, June 2007
- Land EE/CA Response to Comments Document Fact Sheet, July 2007
- Preferred Alternatives Fact Sheet, July 2007

Public comment periods were held May 15, 2006 through June 5, 2006; December 22, 2006 through January 26, 2007; and July 26, 2007 through August 25, 2007 for comment on the nuclear facilities alternatives, land areas alternatives, and preferred alternatives, respectively. Newspaper ads were published in the Niskayuna Spotlight and the Schenectady Gazette to coincide with the first day of each public comment period and issuance of the comment responses.

Supporting SPRU documentation referenced in this action memorandum is located in the SPRU Disposition Project Information Repository at the Niskayuna Branch of the Schenectady County Public Library, 2400 Nott Street East, Niskayuna, New York 12309, and online at www.spru.doe.gov. Additional supporting documentation (e.g., sampling and characterization reports) is also available in the SPRU Disposition Project Information Repository.

6. AUTHORIZING SIGNATURE

This document represents the selected removal actions for the SPRU nuclear facilities and land areas within the KAPL site located in Niskayuna, New York, developed in accordance with CERCLA as amended, and consistent with the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on the administrative record for the site.

John J. Rampe, Manager
SPRU Field Office

9-12-07
Date

7. REFERENCES

R-002255 Environmental Resource Group, LLC. *Land Areas Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project.* December 2006.

R-002266 Environmental Resource Group, LLC. *Nuclear Facility Historical Site Assessment for the Separations Process Research Unit (SPRU) Disposition Project.* April 2006.

R-002271 Environmental Resource Group, LLC. *Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project, Final*. July 2007.

R-002272 Environmental Resource Group, LLC. *Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project, Final*. July 2007.

R-002273 Environmental Resource Group, LLC. *Response to Public Comments, Land Areas Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, June 2007.

R-002274 Environmental Resource Group, LLC. *Response to Public Comments, Nuclear Facility Engineering Evaluation/Cost Analysis for the Separations Process Research Unit (SPRU) Disposition Project*, November 2006.

Attachment I

SPRU Nuclear Facilities and Land Areas
Figures and Photos

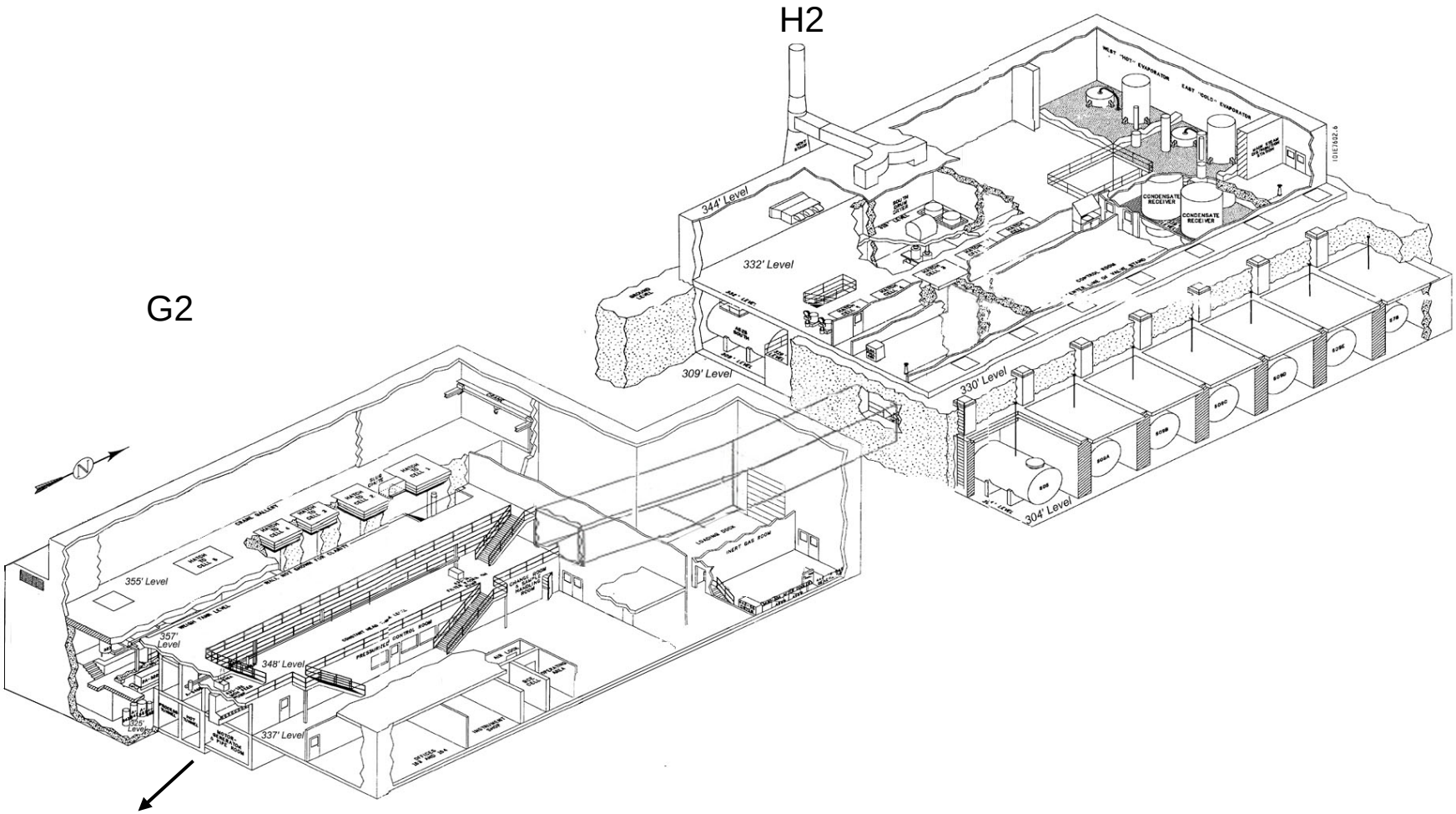
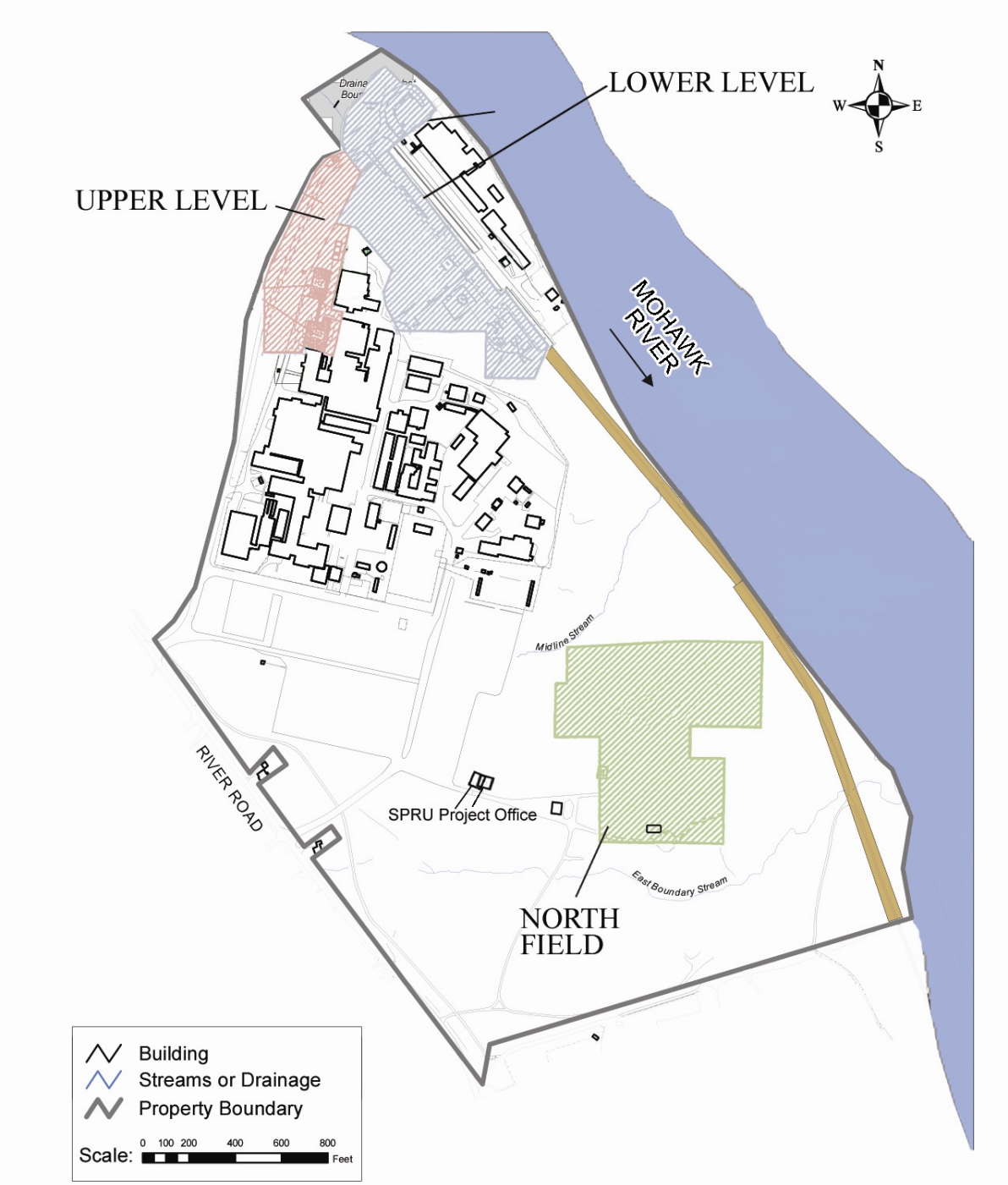


Figure 1. Isometric View of SPRU Facilities



Notes: 1) Basemap Reference Drawing: O'Brien & Gere Engineers, Inc., File No.: 10350.23931-001, Sept. 1999 as modified using Figure A-1 from the CH2M Hill, *Outside Characterization Plan*, TSM-08, Rev. 2, Separations Process Research Unit Project, March 2004 (R-000431).

2) Total SPRU Areas approximately 24 acres.

Figure 2. SPRU Land Areas

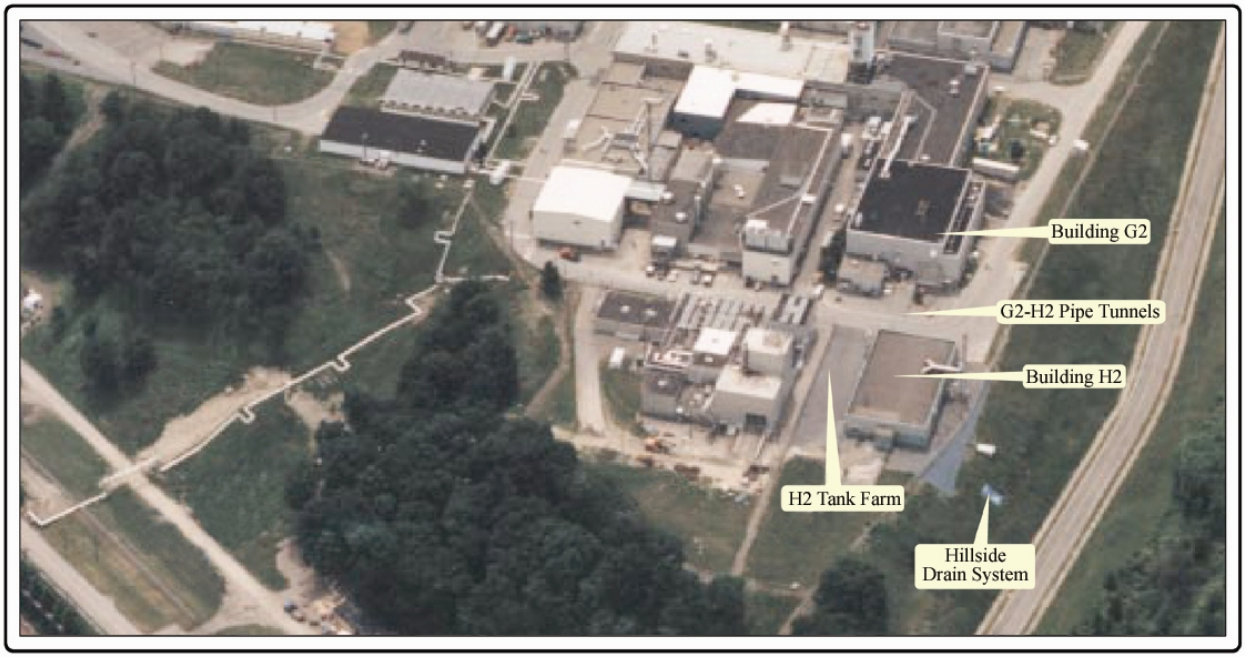


Figure 3. Upper Level

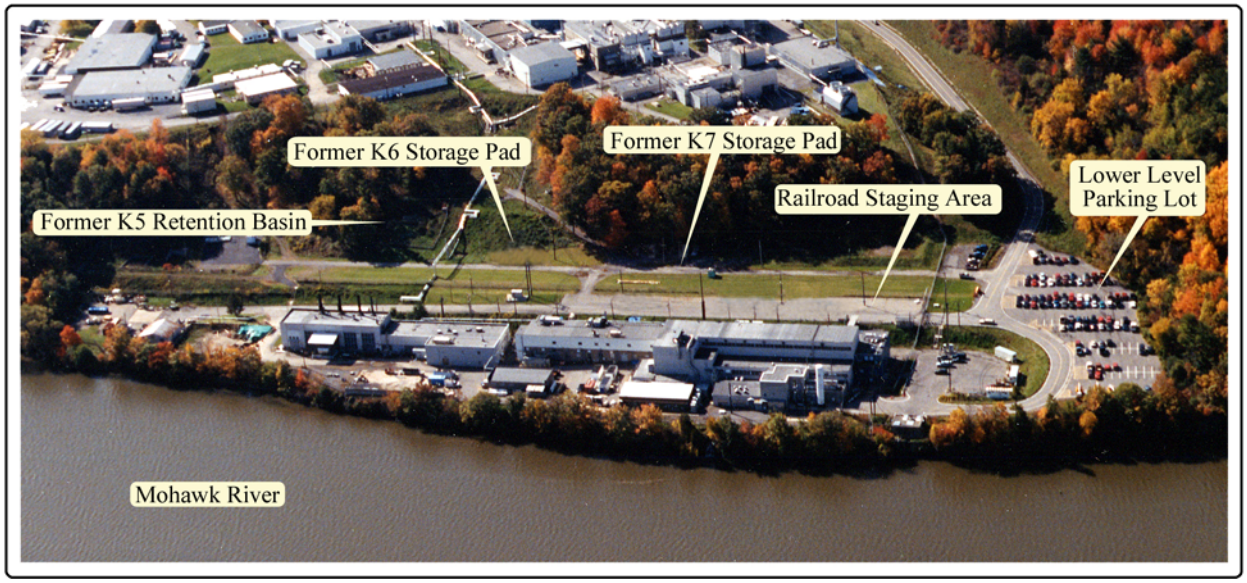


Figure 4. Lower Level

Attachment II

Responses to Public Comments on SPRU Preferred Alternatives